

## H. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, the relative performance of each alternative is evaluated using the nine criteria (Section 300.430 (e)(9)(iii)) of the NCP as a basis for comparison. The purpose of the evaluation process is to determine which alternative: (a) meets the threshold criteria of overall protection of human health and the environment and attainment of Applicable or Relevant and Appropriate Requirements (ARARs), (b) provides the “best balance” with respect to the five balancing criteria of 40 CFR § 300.430(e)(9)(iii)(C)-(G), and (c) takes into consideration the acceptance of the support agency (here, the U.S. EPA) and the community.

As noted above, the MDEQ relied on the comparative analysis performed in connection with the KHL-OU3 to reach a remedy decision for this 12<sup>th</sup> St.-OU4. A formal analysis under the NCP of alternatives in this decision document would result in the same conclusion as those for the KHL-OU3 FS and ROD, and therefore was not conducted in order to prevent a duplication of effort.

### 1. Threshold Criteria

a. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering, or institutional controls. The selected remedy must meet this criterion.

The major exposure pathways of concern at the 12<sup>th</sup> St.-OU4 are ingestion, inhalation, and dermal contact with PCB-contaminated soils, sediments, or residuals in the landfill or in the areas outside the landfill; dermal contact with PCB-contaminated surface water; and ingestion of fish.

Alternative 2 would provide adequate protection of human health and the environment by controlling the mobility of contaminants through engineering and institutional controls. A cap would serve as a barrier to human and wildlife contact with the residuals. An adequate cap would also decrease the rate of precipitation infiltration, thereby reducing the likelihood of formation of new leachate and the potential for PCBs to migrate into groundwater. Construction of new berms would prevent release of PCBs due to side failure. Excavation using visual criteria to remove residuals from the landfill sides, woodland, wetlands, adjacent property, and in a portion of the former powerhouse discharge channel, and relocating the residuals back into the landfill prior to the construction of the cap, will reduce the potential for exposure and migration of PCBs into the environment. A buffer zone will be established between the toe of the newly constructed berm and the former powerhouse discharge channel in order to ensure that, for the lifetime of the

remedy, no hydraulic connection exists between the landfill and the Kalamazoo River/former powerhouse discharge channel.

The No Action alternative does not provide adequate protection because it does not address the existing unacceptable human health and ecological risks associated with the 12<sup>th</sup> St.-OU4.

**b. Compliance with ARARs** addresses whether a remedy meets ARARs set forth in federal and state environmental laws and/or justifies a waiver from such requirements.

ARARs for this RA include the following:

- ? Surface water quality standards contained in Part 31, Water Resources Protection, of the NREPA.
- ? Rules established pursuant to Part 31, Water Resources Protection, of the NREPA regarding permit requirements.
- ? Site-specific pollutant limitations and performance standards which are designed to protect surface water quality contained in the federal Clean Water Act (CWA).
- ? Regulations prohibiting unauthorized obstruction or alteration of any navigable water in the United States (dredging, fill, cofferdams, piers, etc.) contained in the federal River and Harbor Act.
- ? Regulations regarding the dredging or filling of lakes or stream bottoms contained in Part 301, Inland Lakes and Streams, of the NREPA.
- ? Rules prescribing soil erosion and sedimentation control plans, procedures, and measures contained in Part 91, Soil Erosion and Sedimentation Control, of the NREPA.
- ? Rules prohibiting the emissions of air contaminants in quantities which cause injurious effects to human health, animal life, plant life of significant economic value, and/or property contained in Part 55, Air Pollution Control, of the NREPA.
- ? National ambient air quality standards contained in the federal Clean Air Act.
- ? Statutory provisions and rules specifying environmental response, risk assessment, RA, and site cleanup criteria pursuant to Part 201, Environmental Remediation, of the NREPA.

- ? Certain regulations regarding the construction, operation, and closure of sanitary landfills, solid waste transfer facilities, and solid waste processing plants pursuant to Part 115, Solid Waste Management, of the NREPA.
- ? Effluent standards for toxic compounds including PCBs contained in the federal WPCA Toxic Pollutant Effluent Standards.
- ? Regulations regarding activities in wetlands found in Part 303, Wetland Protection, of the NREPA.
- ? Federal regulations under the Toxic Substances Control Act (TSCA) regarding the risk-based disposal of PCB remediation waste, 40 CFR § 761.61(c).

Requirements of the above ARARs will be met by Alternative 2.

The No Action alternative does not meet the ARARs.

## 2. Primary Balancing Criteria

c. **Long-term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Alternative 2 would provide long-term effectiveness via isolation of the residuals by capping and containment. The RA for the landfill will be considered a final action. Long-term O&M and monitoring of the landfill must be provided to ensure that the remedy maintains its ability to protect human health and the environment over time. A final decision on whether additional response actions are necessary for the areas outside the landfill that are part of this RA will be made as part of the ROD for the Phase I portion of the Kalamazoo River.

The No Action alternative does not meet the long-term effectiveness and permanence criteria.

d. **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selection of RA that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume through treatment of the hazardous substance as a principal element.

As detailed above, the stated programmatic goal of the U.S. EPA, as expressed in the NCP, is to select remedies that are protective over time and “minimize untreated waste”, Section 300.430 (a)(1)(i). The NCP states that the U.S. EPA will use “treatment to address the principal threats at a site,

wherever practicable”, Section 300.430 (a)(1)(iii)(A). This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

Alternative 2 would not result in the reduction in the toxicity, mobility, or volume of contaminants through treatment. The employment of treatment technologies at this OU was not found to be practicable. Alternative 2 will, however, achieve significant reductions of the mobility of the contaminants at this OU through containment, and this reduction in mobility will endure for as long as the integrity of the containment system is maintained.

The No Action alternative does not reduce toxicity, volume, or mobility.

e. **Short-term Effectiveness** considers the time to reach cleanup objectives and the risks an alternative may pose to site workers, the community, and the environment during remedy implementation. This criterion also considers the reliability and effectiveness of any mitigative measures taken during remedy implementation to control those short-term risks.

It is estimated that once construction is started, Alternative 2 could be completed in approximately one year. Alternative 2 has some potential short-term negative impacts. For example, truck traffic during cap construction may increase noise and dust in the vicinity of the landfill, however, air monitoring will be required and protective controls will be implemented to suppress dust in order to comply with federal and state air quality standards. The use of erosion controls will be used to mitigate any short-term effects posed by potential siltation and contaminant release to the Kalamazoo River. Health and safety precautions will be undertaken to reduce the likelihood of accidents during construction and to protect site workers and the community from unacceptable exposures to hazardous substances. The discharge of treated water to the surface water of the Kalamazoo River or to the Kalamazoo Wastewater Treatment Plant will be in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. This permit will establish discharge criteria (as administered by the state under Part 31, Water Resources Protection, of the NREPA), that are set at protective levels.

f. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

No significant implementation problems are projected for Alternative 2. Cap and containment system materials are expected to be obtainable from nearby sources and standard construction methods will be used. All necessary excavation and NPDES permits, or any other required permit can be obtained

from the federal or state governments. Excavation firms are available to install sheetpile and remove the residual material from the wetlands, woodland, adjacent property, and the portion of the former powerhouse discharge channel that contains residuals that have eroded from the landfill. Environmental controls will be implemented to prevent air emissions to the atmosphere or migration of PCBs to the river during excavation and cap and containment system construction.

g. **Cost** listed below in Table 1 include estimated capital and O&M costs, also expressed as net present worth. The O&M will need to be continued for the lifetime of the remedy because the remedy leaves hazardous waste at the 12<sup>th</sup> St.-OU4.

TABLE 1

Estimated Cost of Remedial Alternatives for the 12<sup>th</sup> St.-OU4

ALTERNATIVE	CAPITAL	O&M (30 YEARS)	PRESENT WORTH
1. No Action	None	None	None
2. Excavate, cap and contain, wetland mitigation	\$1,769,238	\$434,967	\$2,204,205

### 3. Modifying Criteria

h. **Support Agency Acceptance** addresses whether or not the support agency agrees with, or objects to, any of the remedial alternatives.

The U.S. EPA, as the support agency for the Site, agrees that **Alternative 2** is protective of human health and the environment.

i. **Community Acceptance** addresses the public's general response to the remedial alternatives and to the Proposed Plan. Specific responses to public comments are addressed in the attached Responsiveness Summary.